from a more abundant collection. The axis was rhizomatous, giving off numerous roots at intervals, and bearing two kinds of leaves, one set of petioles being supplied by a monarch leaf trace, and the other set by a diarch trace. The smaller leaves, supplied by the monarch trace, show at base a sheathing organ which is thought to represent the so-called aphlebia of *Zygopteris;* if so, this is the first record of the structure in *Botryopteris*, and further emphasizes the relationship of the two genera. BERTRAND'S view that the simple stele of *B. antiqua* is due to reduction and not to its primitive character is objected to. As the author says, "this view involves the assumption that the diarch type of petiole is older than the monarch, and the species (*B. antiqua*) is in process of simplification. This result is not easy to harmonize with the fact that later forms of *Botryopteris* petiole are triarch."—J. M. C.

Origin of transfusion tissue.—The so-called transfusion tissue of the leaves of gymnosperms has been recognized for many years as an anatomical feature of the group. WORSDELL (1897) suggested, on the basis of distribution and nature, that it is a modified centripetal xylem. Since the presence of centripetal xylem is an important fact in discussing evolutionary sequences, this view extended the range of recognizable centripetal xylem. Now Miss CARTER[32] has studied the beginnings of this tissue in the cotyledons, using 13 species, representing 9 genera of conifers. The conclusion is "that the first-formed transfusion tracheids appeared in such positions and were of such size as to make it appear improbable that they arose, in these organs at any rate, as an extension of the development of the centripetal wood." The evidence from a comparison with the other elements of the vascular strand suggests that "transfusion tissue" develops from the parenchyma.—J. M. C.

The causes of thorn development.—Since LOTHELIER conducted his researches on the experimental morphology of thorns, it has been generally believed that their development is favored and even caused by abundant light or by atmospheric desiccation. This was supposed to be the case particularly in the gorse, *Ulex europaeus*. ZEIDLER now calls these results in question,[33] for he is able to secure the development of thorns in *Ulex* both in partial darkness and in moist atmosphere. He regards the leafy shoots secured by LOTHELIER in moist air and in darkness merely as juvenile forms, whereas the thorny shoots are regarded as adult forms. It may be remarked that, even if further experiment should confirm the views of ZEIDLER, the real problem is in no wise touched by his experiments. It would still remain to determine why "juvenile shoots" should appear at some times and "adult shoots" at other times.—H. C. COWLES.

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[32] CARTER, M. GERALDINE, A reconsideration of the origin of "transfusion tissue." Ann. Botany **25**:975–982. *figs. 4.* 1911.

[33] ZEIDLER, J., Ueber den Einfluss der Luftfeuchtigkeit und des Lichtes auf die Ausbildung der Dornen von *Ulex europaeus* L. Flora **102**:87–95. 1911.